

**Abstract**

The present development relates to a modification of the Houdry process for the dehydrogenation of aliphatic hydrocarbons, whereby the dehydrogenation cycle is extended, or lengthened, and hydrogen gas is added into the reaction. The combination of the extended cycle with 5 the hydrogen introduction results in a surprising stabilization of the production rate in the dehydrogenation process. The hydrogen gas may be introduced through a recycle step. The process of the present development is demonstrated for the dehydrogenation of propane to propylene.